The 39th International Symposium on Lattice Field Theory, Bonn

Jorge Baeza-Ballesteros - Application for financial support

During the last year and a half, I have worked towards a PhD degree at the Universitat de València (Spain), funded by a FPU scholarship from the Spanish Ministerio de Educación y Formación Profesional. My research is focused on the application of numerical techniques to solve problems related to hadron physics and early-universe cosmology.

I work on lattice QCD under the supervision of Prof. Pilar Hernández. Our project, developed in collaboration with Fernando Romero-López, is based on the study of the large N_c limit of meson observables. So far, I have been focused on analyzing the N_c scaling of $\pi\pi$ scattering amplitudes near threshold. I presented our work in the LATTICE2021 conference, and a paper with the results has recently been accepted for publication in JHEP. We are now exploring this processes at higher values of the center-of-mass energy, looking for a possible tetraquark resonance.

Moreover, this year I began a collaboration with Dr. Maxwell T. Hansen during an internship at the University of Edinburgh. We are studying two- and three-particles scattering in the (1+1)-dimensional O(3) non-linear sigma model. Our aim is to compare lattice results to analytical non-perturbative predictions for the model, in order to validate the recently developed three-particle finite-volume formalism.

On the other hand, I study early-universe phenomena using lattice simulations of classical fields under the supervision of Dr. Daniel G. Figueroa. Currently, we are analyzing the emission of gravitational waves from cosmic string loops.

Participating in the LATTICE2022 conference will have a major impact on the development of my research career. It will allow me to make new contacts from the lattice community and also to present some of our recent results. In particular, I would be interested in giving a **parallel talk** about **"Two- and three-particle scattering in the (1+1)-dimensional O(3) non-linear sigma model"**. If possible, I would also present a **poster** updating the state of our research on "$\pi\pi$ **scattering al large** N_c". However, my scholarship does not provide me with money for conferences, and I have very limited financial resources. Therefore, I am applying for a **reduction of the conference fees**.